ABSTRACT

An electron beam apparatus comprises a beam source to generate a radiation beam that is directed onto a photocathode to generate an electron beam. The photocathode comprises an electron-emitting material composed of activated alkali halide, such as for example, cesium bromide or cesium iodide. The activated alkali halide has a lower minimum electron emission energy level than the same material in the un-activated state, and provides efficient photoyields when exposed to radiation having an energy level that is higher than the minimum electron emission energy level. The emitted electrons can be collimated into beams and used to write on, inspect, or irradiate a workpiece.